

New and Interesting Facts from Science and Life

Science Now Finds DISEASE Danger In the HAND SHAKE

AFTER all, there may be more common sense than sentiment in that queer custom of the Chinese who do not shake hands with one another, but perform this ceremony by shaking hands with themselves. As the result of microscopic examinations and analyses of finger nail deposits scientists now

gravely declare that there is actual danger in shaking hands, a custom which has been branded anew as a spreader of deadly diseases.

Science even goes further than this by showing from a medico-legal point of view how the analysis of finger nail deposits will prove of greatest value to police officials in solving crime mysteries and bringing criminals to justice.

However, should any one of your friends suddenly refuse to shake hands with you, or do so under protest, don't feel offended. Doubtless he may be only heeding the warning sounded by Dr. Albert Schneider of San Francisco, who has just announced in the Journal of the American Medical Association the astonishing results of the analysis he made of the deposits taken from the finger nails of 143 subjects.

"The microscopic examination of the deposits under the finger nails," says Dr. Schneider, "promises to be of importance in forensic medicine and also in certain phases of public sanitation and personal hygiene. This form of examination has been practically applied in a number of criminal cases both in this country and in Europe, but so far it has not been adopted as an officially recognized routine in the examination of criminals or those suspected or accused of having committed certain crimes."

"Possibilities of this procedure became apparent to me when incidentally examining the scrapings from my own finger nails and those of my laboratory assistants. The number and variety of substances found was

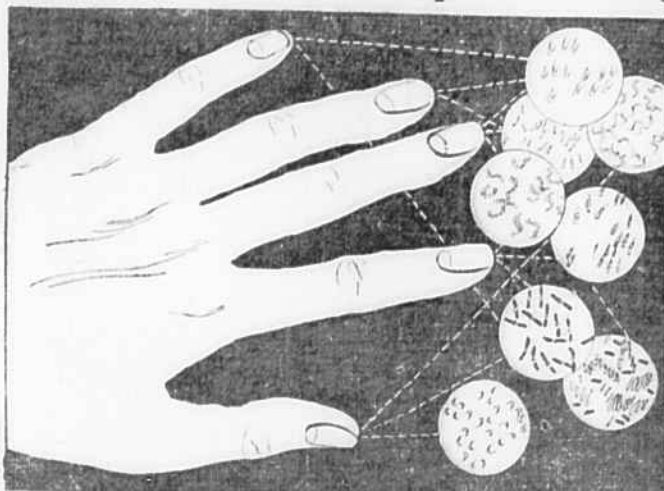
astonishing. Since that time the microscopic examination of finger nail deposits has been made a laboratory exercise for students in connection with the study of fiber and of body cells and bacteria.

"Each student of a class of 46 or 50 was requested to mount the scrapings from the nails of the second and third fingers of the right hand (in case of right-handed persons) on a slide in a drop of water and to examine this carefully under the high-power (450 diameters) of the compound microscope. The findings proved interesting and not infrequently astonishing. The most important part of this laboratory exercise was the interpretation of the findings, which gave evidence of the routine labors engaged in for periods of from one to eight days previous, and of personal habits of the kind and quality of clothing worn, of business occupations, etc.

"It was found that there was a very notable difference in the contents of the deposits of the nails of the right and the left hands, and also in the deposits of the nails of fingers and thumb of the same hand. Numerous examinations proved that the ordinary methods of cleaning the hands by means of soap, hot water and clean towel, inclusive of the usual nail trimming and polishing, as observed by persons of clean and sanitary habits, does not materially alter the microscopic findings; in other words, the usual hand toilet operations do not clean the hands and certainly do not cleanse the inner surface of the free ends of the finger nails. Even the vigorous use of the nail brush with soap and hot water does not result in a removal of all the deposits.

"Of far greater influence is the habitual close trimming of the finger nails as observed by some persons. If the nails are regularly trimmed very close to the point of nearly causing bleeding, very little deposit of any kind will find lodgment. This

How FINGER NAIL Deposits Endanger HEALTH and Furnish CLEWS



"The Chief Source of Danger in the Hand-Shake," Says Dr. Schneider, "Is in the Germ-Laden Deposits Under the Finger Nails."

practice is rare, however, and may be considered the exception to the rule. "The bacteriologic findings of the finger nail deposits are also very interesting. The streptococcus group apparently predominates in most persons, rather than the staphylococcus or the colon bacillus group, as one might reasonably expect.

"Thus far the medical profession has given little attention to the part played by the finger nail deposits in the transmission of infections. That there is danger in the handshaking is generally recognized and admitted by the laity as well as the medical fraternity, but so far there is no effort made to do away with this ancient custom.

"The chief source of danger in the handshaking is in the germ-laden deposits under the finger nails rather than in the hand and fingers. The more important infections traceable to the finger nail deposits may be divided into two groups, namely, self-infections and infections from without.

"There is no doubt that many skin diseases are traceable to scratching. Of such nail-borne autoinfections we may mention lupus, acne, boils and carbuncles, and septicemia. In this manner infections are carried to nose, to eyes, to ears and to mouth and throat.

"Skin infections are transferred from one part of the body to another by the scratching and skin picking habit or by constantly 'digging' or 'picking' at a sore spot, and as a result some persons are never quite free from boils and acne eruptions.

"Infants and young children are constantly picking up infections with their finger nails and transferring these to the mouth, nose, throat and eyes.

"Nail bits very frequently infect themselves through the materials under the nails. Children and some women have the habit of bringing the fingers to the mouth, thus favoring the transfer of infecting material from finger nails to mouth.

"In many cases the infection is traceable to the finger nail deposits of others, as by hand shaking, stroking or crossing the head or face, etc. There is the case of the husband whose neck on the left side was never long free from one or more small pimples, or boils traceable to his wife's habit of playfully pinching his neck. He ascribed the trouble to scratched collars, but several changes in the laundry brought no relief. During the prolonged absence of his wife on a visit with relatives, the trouble disappeared entirely to reappear again on her return with a renewal of the playful habits.

"It certainly requires no lengthy argumentation to prove that there is danger in the finger nail deposits. Most valuable information could no



"In Criminal Cases Finger Nail Deposits of Both the Accused and the Accuser Should Be Taken in the Presence of Police Officials."

doubt be obtained through a careful microscopic and bacteriologic investigation of the nail deposits of the different classes and races of people. Such information would be of inestimable value to physicians, to sanitarians and to the public in general. Furthermore, the occasional if not routine examination of finger nail deposits of patients would frequently give the attending physician valuable information regarding the source of the causative infections and personal habits which might have bearing on the disease.

"From the medico-legal standpoint the examination of nail deposits will

prove of greatest value in those criminal acts in which great violence is employed, as in murder and physical encounters of all kinds. In such cases it would be desirable to examine the nail deposits of both the accused and the accuser, for as is known, persons are not infrequently falsely accused, and particularly in this true in charges of assault. For example, scratches and other skin abrasions on hands and face of the accused should reveal skin epithelium, dermal fragments, blood corpuscles and possibly hair fragments of the accused in the nail deposits of the victim. Valuable evidence may

also be obtained in other criminal acts.

"A husband was accused of having murdered his child. The examination of the husband's finger nail deposits led to the suspicion that he had buried the body in some marshy soil. Careful search along the marshy edge of a nearby stream revealed no newly made grave, but a slightly scooped out depression in the edge of the stream itself proved to be the burial place, and on digging the body was disclosed.

"Efficiency in the line of investigation suggested above depends on long experience in micro-analytic work and on a wide range of microscopic study of all kinds of substances, animal, vegetable and mineral. The time required to qualify as an expert in this line would vary, depending on personal differences; but in all probability the requisite experience, in addition to the necessary educational preparation, such as medical course, university course, special college course, etc., could not be attained in less than 10 years of constant application.

"In medico-legal cases the nail deposits should be taken in the presence of the chief of police, if possible. In some cases it may be desirable and necessary to take the nail deposits on the spot, and the analyst must therefore be vested with the necessary police authority to do this, and he must furthermore be authorized to call to his assistance any police officer that may be available. The deposits should be examined immediately, if possible, in a laboratory supplied with the necessary apparatus and chemical reagents."

The DIGESTIBILITY of Various ANIMAL FATS

RESULTS of some experiments on the digestibility of lard, beef fat, mutton fat and butter are given in Bulletin No. 310 of the United States Department of Agriculture.

It is said that, notwithstanding that fats as sources of energy are from two to four times as effective as either proteins or carbohydrates, their use in diet has received less attention from investigators than other nutrients, that it has been taken for granted that favorable combinations of fat are thoroughly assimilated, and that they do not differ much in their digestibility.

These experiments were undertaken by C. F. Langworthy and A. D. Holmes to determine the thoroughness of digestion of fats, the specific dynamic effort of diet rich in fats

of different kinds, the relation of availability to total energy value of fats, and the relation of domestic ways of using fat to the quality of foods.

"In these experiments," report the two investigators, "the fats were incorporated in cornstarch pudding, which was carefully colored and flavored so that the fatty odors and flavors of the different varieties of fats were disguised. The healthy medical and dental students, between 20 and 30 years of age, employed in the experiments were not apprised of what they were eating; in this way, any possible psychic effect was eliminated.

"It was found desirable to incorporate the food containing the fat in a simple mixed diet, as the ordinary individual soon tires of any single food. In these mixed diets were included a commercial wheat biscuit,

fruit, tea or coffee and a little sugar. Each test period included three days, for nine meals, a period which it was found was long enough for the purpose, but not of sufficient duration to make the diet distasteful.

"The ration was served for one test period in each week followed by a rest of four days, during which the subjects lived on the ordinary mixed diet. Data were recorded with reference to the physical condition of the students both before and after the experimental periods. The amounts and kinds of foods eaten during each three-day experimental period were recorded and samples of food were analyzed to determine the quantity of protein, fat, carbohydrate and mineral matter retained and assimilated by the body.

"Results with the different fats employed are summarized as follows: The coefficients of digestibility were, for lard, 97.3 per cent.; for beef fat, 92.1 per cent.; for mutton fat, 87.6 per cent.; for butter, 97.1 per cent. The average energy value available per man per day, as calculated by the usual factors, was 2235 calories for lard, 2739 calories for beef fat, 2145 calories for mutton fat and 2420 calories for butter.

"These values might be insufficient for severe muscular activity, but would meet the needs of persons following sedentary occupations.

"The average coefficients of availability of energy for the total ration including the fats named were, respectively, lard, 93 per cent.; beef fat, 92.7 per cent.; mutton fat, 91.5 per cent.; butter, 93.9 per cent. These values are somewhat higher than the 91 per cent, which has been found to represent the coefficient of availability for the ordinary mixed diet. It is concluded, therefore, that the different fats did not exercise any unusual effect on the digestibility of the other constituents of the ration.

"It was also found that fats of low melting point are more capable of complete assimilation than those of a high melting point, and that fats differ in their melting point according to the portion of the body from which they are taken.

"In the experiments when the amount of beef fat was 140 grams or over, a laxative effect was experienced which disappeared when the amount was decreased."

USEFULNESS of Loathsome TOAD

THE toad has always been looked upon as loathsome, even poisonous. Yet modern medical research is extracting from toadskins remedies of the greatest value, and the beneficent possibilities of these secretions have by no means been exhausted.

Quick remedies have long been made from the skins of toads, and the Chinese still use such an extract, called, "senso," as a cure for dropsy. A well known remedy among American colonists for sprains and rheumatism was said to be a toad ointment made as follows: Four good-sized live toads; put into boiling water and cook very soft; then take them out and boil the water down to half a pint, and add fresh-churned, unsalted butter, one pound, and simmer together, at the last add tincture of arnica, two ounces.

The natives of Brazil make an ar-

row poison from the creamy secretion of the skin glands of a giant tropical toad, a poison so powerful that it kills big game in a few moments. From this secretion is also obtained a blood-pressure-raising medicine invaluable to the specialists and the surgeon.

An authority says the most valuable and startling part of this toad secretion is the isolation of a beautiful crystalline substance to which toadskin owes its curative powers for dropsy. It seems strange that after a century's ridicule of a toad treatment for dropsy as a mere grandmother's remedy science should now find a genuinely scientific confirmation of the practice. It may be objected that all varieties of toads do not give the same secretion as the giant toad from the Amazon, but it has been found that another crystalline substance, of very similar properties, is found in the skin of the common toad.

KAPOK, the Newest RIVAL to WOOL

KAPOK, the strange name of a material out of which they are now making mattresses, life-belts, pillows, linings for clothes, even underwear, is a sort of silky down similar to cotton, but possessing many advantages over this and even being a close rival to wool. It is the lining of the seedpods of certain species of trees, commonly called silk-cotton trees, which grow in Java, the Philippines, the Antilles, Brazil, India, and, in fact, almost everywhere in the tropics.

Cotton is produced by the seeds of the cotton plant, kapok is a product of the interior walls of the pods. It is a matted, soft mass of fine hairs, each of which is from one-third of an inch to an inch long and from less than a thousandth to about a five-hundredth of an inch thick.

A cubic yard of kapok, packed tight, weighs only 20 pounds. The

property that makes it so valuable is its extraordinary resistance to heat. It is one of the best non-conductors known, and is said to be "warmer" than wool and six times lighter.

An overcoat made of kapok is very light and yet prevents the cold from penetrating or the heat of the body from escaping. This is due to the fact that there is not only a great mass of air among the fibres, but also much air inside them. This is what makes it such an ideal substance for life-preserving mats and belts, as in fresh water kapok can support 175 times its own weight. A man wearing a kapok waistcoat would float like a cork.

It is claimed that no amount of soaking will spoil it, for it cannot decay, its hairs containing no protoplasm and being nothing but fine shells of cellulose, which will nourish no microbes and furnish no lodging place for vermin.

Why Children Like Candy

CHILDREN like candy because of its properties of sugar, a food quickly absorbed by the human system. The purpose of all food is to supply the energy that is wasted by physical exertion. Some foods more than others contain the elements necessary to furnish this supply and vary in the time required to feel their benefits.

Sugar is actually turned into real energy within a few minutes after it is eaten and candy gives a quick supply of the energy called for by the activities of youth. Thus the constant need of energizing force by children leads them instinctively to crave candy.

How to Make a "BOXOPHONE," Unique Musical INSTRUMENT

EXTRACTING music from a piano box after the instrument has been removed is the latest triumph of genius. By means of the "boxophone" the most wonderful tones can be produced, it is claimed. One of the chief advantages of this remarkable device is that, as in the violin, the personality of the touch, which makes that instrument so famous also can be imitated.

To make a boxophone it is not necessary to use a discarded piano box, as any form of box will answer the purpose, the advantage of a large box being that there is more resonance, and it provides space, or width, for a greater number of keys.

A piano box 35x54 inches, the thickness of the boards being immaterial, will answer the purpose. This is set on end, and four inches from the top end a base strip (A), 32 inches long, an inch thick, and three inches wide, is nailed on the box parallel with the edge. A base strip (B), 38 inches long, also 1x3 inches in dimensions, is then nailed across the box diagonally, the upper edge of this strip at the left hand end being 40 inches from the lower edge of the upper base strip (A), measured along the line (1). The other end of the strip (B), measured along the line (2), should be, approximately, 21 inches from the lower edge of the upper strip (A).

The frame is now ready to receive the vibrating members (CC). These should be of dry pitch pine, preferably one inch thick, and 1 1/4 inches wide, which have their ends secured to the upper and lower base strips (A, B) by suitable screws, so that they are a quarter of an inch apart.

To secure the proper musical intervals care must be exercised in attaching the lower ends, for the lengths of these members must have a proper relation to each other. This is provided for in the following manner:

As there are 12 keys to each octave, and each is a half-tone higher (or lower) than the next, it is necessary to make each bar (C) successively shorter as progress is made upwardly along the board; hence thin veneering strips (D) are placed under the lower ends of the bars, thus making a step formation along the base strip (B). More or less of these pieces of veneer can be cut away, until the exact tone or pitch is attained in the vibrating bar.

The length of the first vibrating bar (A) is 40 inches, from edge to

edge of the base pieces (AB). The next vibrating bar A-sharp is 1 1/2 inches shorter, and so on.

Seven inches below the base strip (A) each vibrating bar has an outwardly-projecting arm (J). This is preferably made of hard wood ten inches long, turned up smooth and true, five-eighths of an inch in diameter. Those of the bars A-sharp, G-sharp, D-sharp, F-sharp and G-sharp are to be stained black. The entire set will thus represent the black and white keys of a piano board.

To play the boxophone it is advisable to use coarse kid gloves. The

keys (J) are thoroughly rosined, as well as the gloves. A supply of powdered rosin should be kept conveniently at hand until the keys and gloves are thoroughly primed.

The thumb and forefinger grasp the round key near its base, and the act of drawing the hand forward produces sonorous vibrations which may be modified by pressure and also by the speed of the motion. Both hands may be used alternately on the same key, as in the case of a prolonged note, or the hands may be used on separate keys at the same time to produce harmony in playing. The little inset figure shows the po-

sition of the hand in playing. A foot pedal (K), connected with a damper (L), serves to modify the tone and give it sweetness.

As it is necessary for the operator to stand while playing the boxophone the pedal (K) is preferably a bar which is the same width as the box. The damper (L) is merely a bar with several thicknesses of felt (G), which presses against the inner surface of the sounding board or box (H), this bar being held by two uprights (I). It will materially aid in the mellowness of tone if the box is enclosed, or the lid of the box is nailed on.

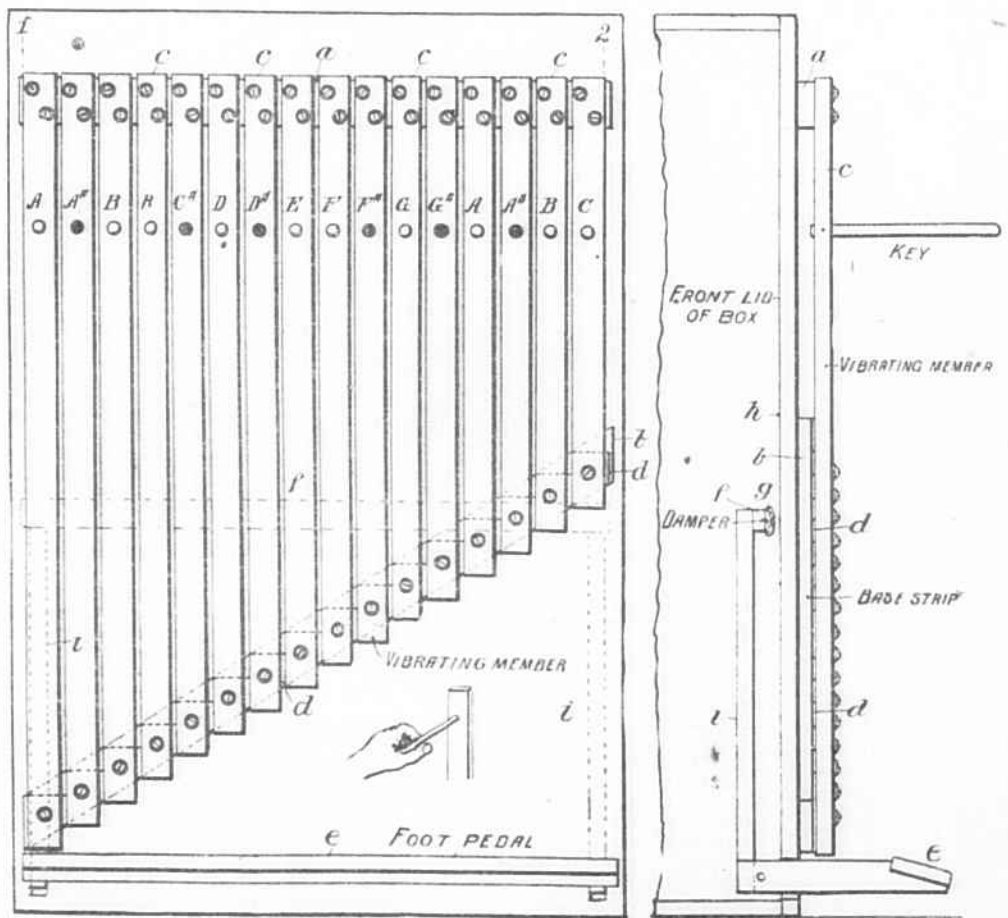


Diagram Showing the Details of Construction of the Boxophone, to Play Which the Performer Wears Coarse Kid Gloves.